

TROPICAL RAINFALL MEASURING MISSION

December 13, 1999 - December 19, 1999

DOY 347 - 353

Day of Mission 745 - 751

TRMM MISSION OPERATIONS

- TRMM is flying in the +X Forward direction as of 99-344, at 19:42:52z.
- The next Yaw maneuver is scheduled for December 24th (99-358).
- Delta-V maneuver #149 is scheduled for December 22nd (99-356) using the LBS thrusters.
- The Beta angle range for 99-354 to 360 is +10.2° to -9.7°.
- The next Monthly Status Review is scheduled for 00-012.

TRMM SUBSYSTEM OPERATIONS

Attitude Control System (ACS)

Delta-V maneuver #146 was successfully conducted on 99-347 at 16:00:27z and 16:46:17z, for durations of 44.000 and 26.375 seconds respectively, using the LBS thrusters. The off-modulation of the -Yaw thruster (#1) for burn 1 was 8.2% (91.8% on time). The off-modulation of the +Pitch thruster (#2) for burn 1 and 2 was 21.9% and 26.5% (78.1% and 73.5% on time). The remaining fuel is 653.527 kg, and the final apogee and perigee height is 354.46 km x 347.58 km.

Delta-V maneuver #147 was successfully conducted on 99-350 at 15:55:34z and 16:41:16z, for durations of 34.000 and 25.250 seconds respectively, using the LBS thrusters. The off-modulation of the -Yaw thruster (#1) for burn 1 was 1.5% (98.5% on time). The off-modulation of the +Pitch thruster (#2) for burn 1 and 2 was 22.8% and 27.2% (77.2% and 72.8% on time). The remaining fuel is 652.110 kg, and the final apogee and perigee height is 354.87 km x 347.58 km.

Delta-V maneuver #148 was successfully conducted on 99-353 at 16:57:14z and 17:42:58z, for durations of 33.000 and 23.000 seconds respectively, using the LBS thrusters. There was no off-modulation of the -Yaw thruster (#1) due to the short duration of burn 1. The off-modulation of the +Pitch thruster (#2) for burn 1 and 2 was 21.6% and 23.9% (78.4% and 76.1% on time). The remaining fuel is 650.759 kg, and the final apogee and perigee height is 354.92 km x 347.51 km.

A special Delta-V maneuver on December 29th (99-363) will place TRMM above the nominal orbit box for the year rollover. This will help prevent TRMM from falling below the box in the event communication with the spacecraft or the ground system is lost for an extended period due to Y2K. The initial prediction shows burn #1 to be 76 seconds and burn #2 to be 57 seconds. ACS system tables #73 (Delta-V Parameters) and #85 (Ephemeris Limits) will be temporarily changed because the first burn exceeds 60 seconds. Testing is completed on these tables and they are ready to be uplinked.

A special RTS is being built for the year rollover that will place the Observatory in Sun Acquisition mode if communication is lost for more than 24 hours. A start RTS command will be placed towards the end of the daily ATS load for 00-001. A ground command will be sent to disable the RTS before it is started if all systems check out good in the new year. Testing still needs to be completed with this new RTS.

Flight Data System (FDS)/Command & Data Handling (C&DH)

The frequency standard continues to drift in the negative direction. The frequency remains x77D with a current drift rate of $-2.0 \mu\text{s/hr}$. The UTCF remains at 31535996.854485 sec with a current drift value of $-751 \mu\text{s}$.

Q-Channel restarts occurred on 99-348 at 06:48:30z and 99-351 at 15:22:37z and 19:26:11z.

EDAC multi-bit errors occurred on 99-349 at 14:08:44z, 17:33:54z, and 20:11:02z.

Reaction Control Subsystem (RCS)

The RCS subsystem performed nominally during this period. See the ACS section for specific Delta-V information.

Power Subsystem

The Power subsystem is operating nominally.

Electrical Subsystem

The Electrical subsystem operated nominally during this period.

Thermal Subsystem

The Thermal subsystem operated nominally during this period.

Deployables Subsystem

The Deployables subsystem performed nominally during this period.

RF/Communications Subsystem

The RF/Communications subsystem performed nominally during this period.

SPACECRAFT INSTRUMENTS

CERES

The CCR which involves creating and testing TSMs to monitor the CERES current is expected to be closed out by the end of the year. A walk-through was held December 15th for the removal of

CERES from load-shed plan and the test results. The TRMM FOT awaits final approval and if Terra checkout goes as planned, CERES will be powered on in mid-February

Currently plans are to resume operations once the TERRA spacecraft has completed checkout in January 2000. There are no plans to manually remove power from the instrument once operations have resumed.

LIS

LIS performed nominally during this time period.

PR

PR performed nominally during this time period.

The list of Internal Calibration times over Australia in which PR was not radiating is listed below:

1999/347:02:13:37 - 02:17:42z
1999/347:08:44:06 - 08:46:20z
1999/348:09:06:33 - 09:08:41z
1999/349:07:55:10 - 07:57:23z
1999/350:00:15:04 - 00:17:27z
1999/350:08:17:39 - 08:19:46z
1999/351:07:06:21 - 07:08:32z
1999/351:23:24:30 - 23:29:14z
1999/352:07:29:15 - 07:31:15z
1999/353:06:17:37 - 06:19:47z
1999/353:22:35:35 - 22:40:35z

Three External Calibrations were performed per NASDA request on 99-350 at 14:52:03z (beam #49) and 16:28:29z (beam #75) and 99-351 at 15:16:18z (beam #33).

TMI

TMI performed nominally during this time period.

VIRS

VIRS performed nominally during this time period.

GROUND SYSTEM

Testing of release 8.1 has found two new DRs with the system software. It is believed that these DRs have always existed on previous software releases but never discovered. Due to these new problems, release 8.1 can not be fully tested and has been rejected by the FOT. A new release will be delivered sometime after Y2K.

Testing of mission planning is complete on string three and it will be made operational the week of December 20th (99-354). It will serve as a backup to mission planning during the year rollover.

Due to HST and the launch of Terra and STS103, the TRMM FOT had to reschedule many events on 99-353 for the following day (Event #144). One event had to be declared a critical support to prevent a recorder overflow which would have occurred between two events that were five hours apart.

Event Reports

#144: Day 354 TRMM Scheduling Conflicts

Generic Late Acquisition Reports (for TTRs 19639)

No new Late Acquisition Reports were opened during this week.

New Anomaly

No new Anomaly Reports were opened during this week.

Recurring Open Anomalies

No recurring anomalies were seen during this period.

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